

Oregon Statewide Recycling Collection List and Producer-Collection Materials for Recycling

This information is submitted by the Foodservice Packaging Institute in response to the February 3, 2022 Request for Information: Oregon statewide recycling collection list and producer-collected materials (for recycling).

We welcome questions and can provide additional details upon request. Please contact:
Ashley Elzinga
571-407-1434
aelzinga@fpi.org

Background

The Oregon Department of Environmental Quality has requested technical information that can be used to evaluate materials against evaluation criteria set forth in statute. The Oregon Plastic Pollution and Recycling Modernization Act was passed into law in 2021 requiring numerous changes that are intended to modernize and stabilize recycling services in Oregon.

The Foodservice Packaging Institute (FPI) was founded in 1933 and is the leading authority for the North American foodservice packaging industry. FPI encourages the responsible use of all foodservice packaging through promotion of its benefits and members' products. FPI's core members are foodservice packaging manufacturers and their raw material and machinery suppliers. With over 75 members, FPI includes approximately 90% of converters and suppliers in the foodservice packaging industry in North America, and over 200 foodservice operators, distributors, and educational institutions.

FPI is committed to reducing the impact of its products on the environment and is dedicated to making sure these items recovered and diverted from the landfill. FPI has a separately funded recovery group with a focus on paper and plastic cups, containers, bags, and boxes. Since 2011, this group has been working with communities, recycling facilities, composters, and end markets to expand to find stable and sustainable recovery solutions for these valuable materials. This group receives technical support from Resource Recycling Systems (RRS).

Through the [Community Partnership program](#) that launched in 2017, FPI has partnered with 15 residential programs to add foodservice items to their accepted material lists. The specific items are determined through consultation with the individual program, the Material Recovery Facilities (MRF) and end markets that process the community's materials. Once FPI determines viability for inclusion of foodservice packaging materials into the prospective community recovery program, FPI works with the city and/or municipality to educate residents on best practices for recovery. This education campaign is a crucial component of every Community Partnership and helps elevate the whole community recovery program, not just the foodservice items. Because these efforts

are market-based, they have proven stable and sustainable without further assistance from FPI, and the partners report numerous benefits to their programs.

This RFI submission provides information regarding polypropylene cups and containers to support decisions around their inclusion in the uniform Statewide collection list (USCL). The data has been compiled with the assistance of technical consultant, RRS, who has conducted ongoing research on recycling and recyclability of these materials for FPI and other clients.

Plastics: PP Cups and Containers

Polypropylene (PP) resin, designated with the #5 resin identification code, is one of the most common resins in foodservice packaging applications, used for foodservice packaging including drink cups, deli tubs, takeout dishes, and thermoformed containers.

FPI Research

Since the inception of the FPI's recovery efforts over ten years ago, FPI has been conducting research on recyclability of foodservice packaging in order to understand and overcome potential barriers to its recovery. This research has provided the foundation for FPI's successful Community Partnership program. Many of these studies have been collaborations with other industry stakeholders including the Association of Plastic Recyclers and the Sustainable Packaging Coalition, and since 2012, much of this research has been conducted with technical support from RRS and other technical experts including Cascadia Consulting, DSM, Stina (formerly More Recycling), and Moore and Associates. Below is an overview of these research efforts and the questions they were designed to address.

Overview of FPI's Foundational Research

| How much material is available? Estimated material generation | Who's recycling FSP? Conducted MRF Benchmarking Study | Are there end markets for FSP? Published end markets map | What are the access rates for FSP? Co-sponsored SPC Centralized Study on the Availability of Recycling | | Where are domestic end markets for Paper FSP? • Surveyed mills • 4 mills accepting paper FSP • 16 markets at end of 2018 • 21 markets at end of 2019 • 30 confirmed markets at end of 2020 | | | |
|---|---|---|--|---|---|--|---|---|
| | Will the material flow to the right bale? Co-sponsored MRF Material Flow Study | | How to expand end markets for FSP? Engaged in end market outreach, partnerships & development | | | | | |
| 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| Where is the material available to be collected? Learned curbside had greatest volume for collection | Is food residue a problem? • Food Residue Study (Boston) • Food Residue Study (Delaware) Found little to no difference between FSP versus other commonly recycled food packaging | | How much FSP arises in bales? • Analyzed mixed paper bales in Seattle and NYC • Co-sponsored Rigid Plastics Bale Audit | What messaging is clearest for residents? Conducted National Resident Messaging Survey | How to add FSP to city's materials? Developed image library, flyers, ads, video, best practice language | How does compostable FSP contribute as a feedstock? Found compostable FSP provided the same benefit as traditional carbon / bulking materials | Where are North American end markets for Plastic FSP? Surveyed PET, PP, and PS end markets | How can plastic FSP be made more recyclable? Partnered with APR to develop Design Guide for Foodservice Plastics Recyclability |
| | How will FSP impact the bale? Estimated impact | | | | Which cities and composters accept FSP? Co-sponsored BioCycle residential study and surveyed composters | | | How can more PET be recycled? Spearheaded collaborative study |

Overviews of studies are available at www.recycleFSP.org

Studies of particular relevance for PP cups and containers can be found in the appendix. They include research in the following areas:

- [Food Residue Studies](#)
- [MRF Flow Studies](#)
- Mixed Plastic Bale Sorts ([2015](#) and [2021](#))
- Reclaimer Surveys (reflected in FPI's [End Markets Map](#))
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The Stability, Maturity, Accessibility and Viability of Responsible End Markets

The following map shows North American end markets for PP (yellow diamond) and mixed plastic (red diamond) bales. The list is a result of a bi-annual survey of plastics reclaimers, last conducted in 2020, supplemented with more recent market information and announcements. FPI maintains an interactive map of end markets by commodity at <https://www.recyclefsp.org/end-markets-map>. These markets source from a wide geographic region with Oregon-based materials known to travel to the eastern part of North America (see letter of support from EFS). End markets do not distinguish between PP cups / foodservice containers and other types of widely recycled PP such as dairy tubs. ISRI / APR specifications include these items in the specification for 1-7 and 3-7 bales. This is a growing market with increasing demand from reclaimers and manufacturers. See attached

letters of support in Appendix from Denton, EFS and Green Rhino. Generally speaking, this is representative of overall end markets .



Figure 1. End Markets that Accept PP cups and containers. Source: <https://www.recyclefsp.org/end-markets-map>

This includes the following reclaimers:

- Merlin Plastics – Delta, British Columbia: All Rigids #1-7
- EFS Plastics – Lethbridge, Alberta: All Rigids #1-7
- St Joseph Plastics – St. Joseph, Missouri: PP bales
- Nursery Supplies – Jacksonville, TX: PP Bales
- IntegriCo – Sarepta, Louisiana: PP Bales
- KW Plastics – Troy, Alabama: PP Bales
- Pre-Zero Polymers – Westminster, South Carolina: All Rigids #1-7
- Custom Polymers - Charlotte, North Carolina: All Rigids #1-7
- Champion Polymer Recycling – Winchester, Kentucky: PP Bales
- East Terra Plastic – Indianapolis, Indiana: PP Bales

- Sirmax – Anderson, Indiana: PP Bales
- Mel Tech Plastics – Tilbury, Ontario: PP Bales
- Revital Polymers – Sarnia, Ontario: All Rigids #1-7
- EFS Plastics – Listowel, Ontario: All Rigids #1-7 & PP Bales
- Urban Polymers – North York, Ontario: PP bales
- Nursery Supplies – Chambersburg, PA: PP bales
- Trigon – Newmanstown PA: All Rigids #1-7

In addition, there are two emerging local markets in Oregon interested in sourcing PP Bales:

- Denton Plastics, located in Portland, accepts PP cups and containers in incoming bales. As described in their letter of support (located in the Appendix), Denton is experiencing expanding demand and wants to ensure an adequate supply to feed a growing operation.
- Similarly, a new plastic reclaimer, Green Rhino, is in the process of starting up in Tigard and would like to ensure an adequate supply of source separated PP for the plant. See letter of support in Appendix.

Regionally, PreZero US, located in Los Angeles, is an end market who sources mixed rigid plastics. PP cups and containers are acceptable in incoming bales (See Appendix for full letter of support). Additionally, EFS Plastics is eager to work with communities and MRFs in Oregon and keep PP in circulation. EFS Plastics has seen rapid growth in recent years and expects increased demand for PCR PP in the coming years. EFS has provided a letter of support, found in the Appendix.

The Anticipated Yield Loss for the Material During the Recycling Process

MRF Capture / Yield Loss

RRS data indicates that PP cups and containers typically have a high rate of capture / low level of loss in a MRF environment.

- According to a 2015 MRF flow study (see Appendix), PP cups flowed reliably to the container line (average loss rate to paper stream was 10%, and at the best-performing MRF, it was only 3% - note that this study represented a baseline where the MRFs had not undertaken any efforts to maximize capture of these items). The same study found the PP held its shape well and generally flowed to the container line. There are no specific studies conducted by FPI to document the flow of PP trays and other containers.
- More recent research undertaken by RRS found that more than 80% of PP cups and containers were properly directed to the container line in a typical single stream MRF environment, while less than 20% traveled with two dimensional materials to the paper line. These are likely lids or flattened containers. RRS research has also found that PP cups and containers that reach an optical sorter are captured nearly 90% of the time, and less than 10 percent of PP flows to residue. Capture in the MRF would be increased if quality control measures were implemented on the paper line.

Reclaimer Capture / Yield Loss

RRS research indicates that the reclaimer yield loss when recycling PP is approximately 30%. By comparison, this is lower than the yield in a typical curbside collected PET bale (38%) but higher than the yield loss of HDPE bottle bales (18%).

The Material's Compatibility with Existing (Oregon) Recycling Infrastructure

According to FPI research, most foodservice packaging is discarded at home or in the workplace. This means that residential curbside collection offers significant potential for capturing this material to achieve optimal diversion. Due to conditions spurred by the ongoing pandemic, takeout and delivery have likely prompted more opportunity for at home collection.

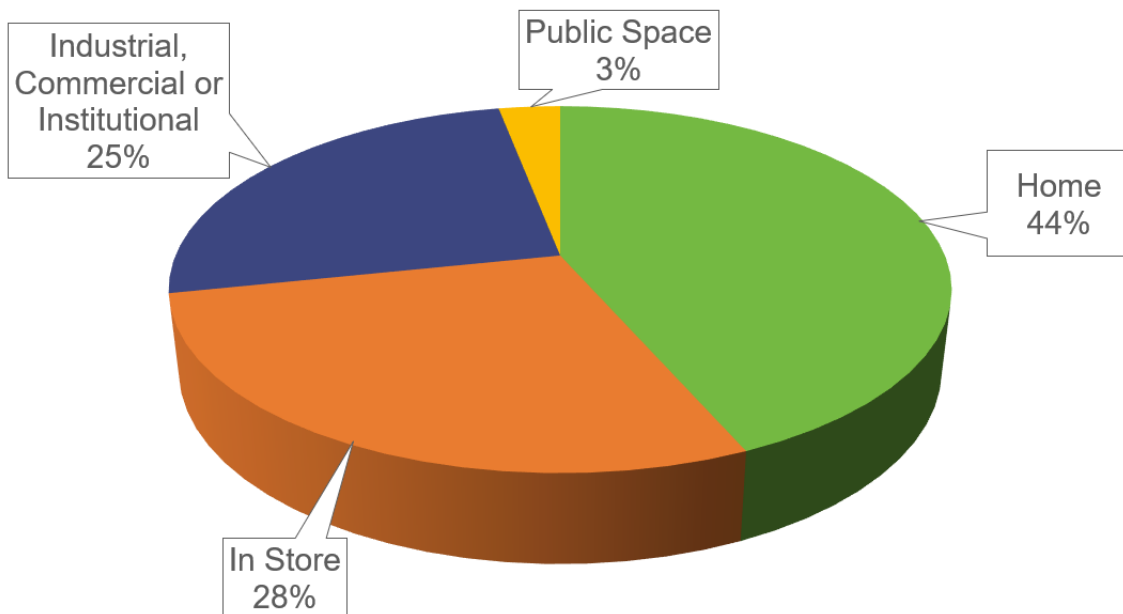


Chart showing breakdown of foodservice packaging by point of disposal

Round containers greater than 6 oz are currently accepted in a majority of households in Oregon. This would encompass some foodservice packaging PP containers, such as deli tubs. Drink cups, trays, lids, and other foodservice packaging containers are not yet generally accepted in Oregon's franchise collection programs. An FPI-sponsored study is currently underway which will provide more detailed insights into whether any Oregon communities accept these items cups in residential programs.

As noted above drink cups behave like "tubs" or "round plastic containers" through the recycling system. This is relevant because some recycling guidelines, such as those listed by [Metro Regional Government](#), accept "round plastic containers" but explicitly prohibit "plastic beverage cups". This is confusing and contradictory, as PP beverage cups are round containers typically greater than 6 oz., they flow through the MRF in the same way, and are just as valuable to end markets, yet are not currently collected.

The Amount of Material Available

There are varying estimates of the availability of PP Cups and Containers, ranging from 8.5 to over 20 million lbs generated in Oregon.

- 2016 Oregon Waste Characterization study indicated 3,712 tons (7.4 million lbs.) of 8oz and larger tubs and another 544 tons (1.09 million lbs.) 6oz tubs, for a total of 8.49 million lbs estimated PP availability.
- Based on national sales data from the American Chemistry Council in the 2020 Resin Review, in 2019 there were 789 million lbs. of PP cups and containers sold into the US market. When looked at on a per capita basis this amounts to 2.3 lbs. per year or about 9.9 million lbs. per year available material.
- According to The Recycling Partnership's *2020 State of Curbside Recycling report*, some limited data from capture studies suggest there may be as much as 17 pounds of polypropylene available per year from a single-family household. This would place polypropylene at higher generation rates than both natural and colored HDPE. Total annual polypropylene tonnage by U.S. single-family households would be an estimated 827,000 tons or 1.65 billion pounds. Extrapolated per capita into Oregon this could represent over 20 million lbs of material.

The Practicalities of Sorting and Storing the Material

It is RRS' understanding that most Metro MRFs would sort PP into mixed plastic 3-7 bales. However, growing demand for #5 bale and support for MRF upgrades through the PP Coalition has the potential to shift the market away from mixed bales toward PP specific bales. Nationally, the trend among MRFs operated by the enterprise companies (WM, Republic, Waste Connections) and regional entities is also to move away from mixed plastic and toward PP specific bales.

When considering mixed bales in relation to PP cups, a 2020-2021 bale audit was conducted by FPI and RRS to evaluate prevalence in bales marketed by MRFs¹. The study consisted of nine bales, classified into either *pre-picked rigids plastics: with bulky* or *pre-picked rigids: no bulky*. Within the *pre-picked rigids: no bulky* category, cups made up a small portion of all the bales sorted, averaging just over 6% of the total bale weight. This bale sort study shows that plastic cups are still successfully reaching plastic reclaimers, where they can be recycled into new products. By including cups and other non-bottle plastic containers in residential recycling programs, communities can provide a pathway for these cups and containers to be recycled. See Appendix for full study.

See additional notes on material flows in the anticipated yield loss section above.

Contamination

There are multiple aspects of contamination to consider. One issue is food residue on the packaging. According to a series of studies looking at food residue in foodservice packaging conducted by FPI in 2013 and 2014 the amount of residue in foodservice packaging was similar to any other type of food contact packaging and

¹ RRS was unable to source bales for this study from the west coast; bales audited were sourced from CO, NE, IN, OH, VA, SC, GA and NY. The results were similar to those of an earlier [study](#) that did include west coast bales.

determined to be consistent with what markets are accepting. Cups are used to contain liquids, and generally, residual liquid drains out of the cup by the time it reaches the MRF.

Another issue is related to cross contamination, when the material flows to the non-target material stream. As noted above. PP cups and containers are correctly captured 80% of the time. Cross contamination is primarily a result of two-dimensional lids flowing to the mixed paper line. Additional quality control on the paper line can reduce cross contamination and yield loss.

The real-world experiences of communities and MRF accepting PP cups and containers indicate that with good resident education, PP cups and containers other foodservice packaging can be added successfully while reducing overall contamination. The communities and MRFs that have participated in FPI's Community Partnership program have not reported any problems with quality or marketability of bales as a result of adding PP cups and containers, and the foodservice items added via the partnerships remain in their programs.

The Ability for Waste Generators to Easily Identify and Properly Prepare the Material

PP cups and containers are easily identifiable by waste generators by looking at the #5 resin identification code. Alternatively, residents of programs that use broader language such as "plastic cups and containers" can usually identify the accepted items intuitively.

The only preparation needed is to empty the cup/container and remove the lid or any other ancillary items.

FPI inventoried the messaging used in leading recycling programs, the terminology recommended by several industry groups, and conducted a resident messaging survey specific to foodservice packaging in order to develop best practices. FPI employs these findings in every Community Partnership program and resident communications for each program addition. These best practices include recommended terminology, effective graphics, and simple preparation instructions aimed at promoting recycling of clean and empty items and minimizing contamination ([the resident education kit, including the study results, is available for download](#)). The graphics feature clean, empty cups, with no lids or straws attached. This messaging strategy has proven effective, and our partner communities have reported reductions in residue following the communications campaign.

Economic Factors

Historically, PP items have been marketed in mixed plastic bales. However, there is increasing demand for a single resin PP bale. The demand for polypropylene bales is strong currently with an average national price over the past 12 months of \$.29/lb. This is higher than the price of curbside PET bottles (based on data from recyclingmarkets.net). Mixed plastic 3-7 bales have a 12-month average price of about \$.01/lb (based on data from recyclingmarkets.net).



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OREGON DEQ RFI RESPONSE: PP CUPS & CONTAINERS

A key economic factor for capture of PP is related to volume. In recent years, a number of foodservice brands have begun using polypropylene cups. PP cups and containers have an increasing market share and can be expected to bring added value into the recycling system whether it is sorted into PP bales or increases PP content in mixed bales, which could result in higher prices. If more PP were to enter the curbside stream there is greater incentive and logistical rationale to sort into a PP bale, which has higher market value and increasing demand.



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Appendices

- FPI: Food Residue Study Overview
- RRS, Reclay StewardEdge, and Moore Recycling: MRF Material Flow Study Summary
- FPI: Plastic Cups Bale Sort Findings
- Denton Plastics Letter of Support
- Green Rhino Letter of Support
- PreZero US Letter of Support
- EFS Plastics Letter of Support